CHAPTER 7

Demographic Overview of the African Burial Ground and Colonial Africans of New York

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The origins of Africans in colonial New York, and some conditions encountered upon their arrival, have been explored in the two preceding chapters. The objective of the current chapter is to reconstruct who these diverse Africans became as a single population/community (that used a common cemetery) once in New York City. This chapter serves as both an historical demographic (based on documents) and paleodemographic (based on skeletal assessments) overview of the structure of the African population of colonial New York.

The overview is based on the synthesis of the research outcomes that is presented in the New York African Burial Ground Project (NYABGP) *Final History Report*, which are related mainly to municipal censuses, and the analyses and interpretations of the skeletal biological research team that are concerned primarily with mortality. The goals of the analyses presented herein are to: 1) establish population profiles and demographic trends for the New York African Burial Ground (NYABG) skeletal sample that integrate these two data sets; 2) reveal the New York African population in relation to its surrounding, temporal, political, economic, and sociocultural landscape; 3) place the NYABG skeletal sample within the biohistorical framework of the African diaspora in America; and 4) provide a conceptual framework for the archaeological research work.

The research presented in this chapter is not based on a set of hypotheses but instead begins to track relationships among demographic variables and between the demography and historical attributes of this sample. This sample is unique compared to the other African Diasporic skeletal series, differing in such features as sample size, time period, and a regime of urban enslavement. The only ubiquitous demographic trait identified in all series is that of high infant mortality rates. The political economic, environmental, and socio-cultural context of each sample produces a variety of patterns that will be discussed near the end of the chapter. A more comprehensive and etiological discussion of demographic political economy is presented in Chapter 14 of this report. The current chapter is to provide a sufficient demographic background to facilitate the reader's evaluation of the health effects discussed in chapters 8-13.

This chapter is organized into three sections; the first presents a brief discussion on paleodemography and its limitations followed by the paleodemographic data including the age and sex composition of the NYABG sample, mortality patterns of subadults and adults, life expectancy, and sex ratios. The second section summarizes the historical demographic data within an historical context. This includes population size, age and sex composition, sex ratio, and mortality trends shown in living people for the colonial period. The third presents comparative population parameter assessments from the African diaspora and colonial New York.

The sum of demographic research of the ABGP consists of data on migration, fertility, mortality, and population structure. Demographic profiles can reasonably document the movements of Africans into and out of colonial New York City, the proportions of men, women, and children of different ages who comprised its African

community, their frequency of death and life expectancy at different ages, and changes in population size and composition. Therefore, these population profiles provide a means of determining who constituted the African community during the historical development of the city. Changes in population profiles reflect changes in the social, economic, political, and environmental conditions that shaped the Colonial African experience in New York.

Taking into consideration that investigating the African presence in the archaeological and historical record is a "search for the invisible people" (Rankin-Hill 1997), the quantity and quality of data available for this study is sufficient for an accurate reconstruction of the larger living African community of colonial New York City, including those persons interred in the African Burial Ground. For the colonial period, there are two main data sources: historical archival/documentary evidence and paleodemographic evidence.

Census data and other historical documentation are available for colonial New Yorkers, primarily Euro-Americans and to some extent Africans. These data are useful for understanding migration, fertility, and population structure although there are also significant limitations with these sources. These limitations include: a lack of detail in the available historical and archival documents; changing categories between censuses and other sources (e.g., the age when a child becomes an adult); undercounts of Africans due to smuggling, under-reporting cargo and property subject to tariffs and taxation. For example, in the Spanish slave trade "Piezas de India" (Curtin 1969) were recorded as cargo; this could refer to one or a hundred enslaved Africans. The available census data are less useful for assessing mortality than is the paleodemographic accounting of the dead themselves. The strengths of each data source can compensate for the weaknesses

in the other. The synthesis of skeletal and historical/archival sources provides a window into the life and death in the colonial city. Furthermore, the comparison of historical/archival and paleodemographic analyses provides a means of exploring critical questions and complex biocultural interactions.

An extensive discussion of documentary evidence for New York's demography is provided in the *History Final Report* of the ABGP. However, some of the key data from the historical work will be integrated throughout the demographic discussions and in skeletal biological chapters. Some answers are already possible from the available, integrated data. In other cases, questions have been directed to the historians' work for possible resolution.

Paleodemography

Paleodemography is the study of archaeological populations based on skeletally determined age and sex. Paleodemographic analyses provide a means for assessing mortality and are less effective with some other demographic variables. For example, estimates of and discussions concerning fertility are generally limited in general from skeletal remains; factors such as high levels of forced and/or voluntary migration and trading of enslaved African people would only further complicate assessment.

In the last 30 years since Angel's (1969) article "The Bases of paleodemography," there have been several phases of intense criticism followed by discourse and proposed solutions to the intrinsic problems of paleodemographic studies. In the 1970's the major focus was on the uses and problems of utilizing life tables with skeletal populations (e.g., Moore et al. 1975; Buikstra 1976).

In the 1980s, there were two major critiques of paleodemography, the most significant by Bocquet-Appel and Masset (1982) stating that paleodemographic techniques were so flawed that the field should be abandoned, and they heralded their "farewell" to its "death." Their criticisms were based on two major points; they maintained that: (1) the age structures of skeletal samples reflect only the age structures of reference populations by which skeletal aging criteria have been established; and (2) age estimates of adults lack sufficient accuracy to allow for demographic analysis. Age estimates, then, are seen as mere "random fluctuations and errors of method" by these authors. This launched extensive debates into the early 1990s by numerous authors, for example: Van Gerven and Armelagos 1983; Buikstra and Konigsberg 1985, and Greene, Van Gerven, and Armelagos 1986, dispelling the idea that age assessment was so flawed it rendered paleodemography as a dead area of research.

The second major critique in the 1980s by Sattenspiel and Harpending (1983) and Johansson and Horowitz (1986) brought to the forefront the concept that the fundamental assumption of nonzero population growth of life tables and other demographic models/analyses could actually distort age at death distributions so that they reflect fertility more than mortality (Milner, Wood and Boldsen 2000).

In the early 1990s, Wood et al. (1992) document three critical problems in paleodemography using archaeological data sets and models to establish their argument. These three problems are: demographic non-stationary (that populations are not stable/stationary as previous models assume); selective mortality, only those that succumb at any given age are represented in a skeletal population; and, hidden

heterogeneity in risks, unknown mix of individuals with mixed susceptibilities makes aggregate data almost impossible to interpret.

These changes and developments lead us to a variety of possible solutions, questions, and modeling to explore in paleodemographic studies, according to Wood et al. (1992). Others have begun to explore both methodologically and theoretically the direction of paleodemographic research in the future (e.g., Sanders and Hoppa 1993; McCaa 2002). Notwithstanding the limitations of paleodemographic assessments, cautious and substantive inferences from the population structure of the dead to that of the living can be developed.

New York African Burial Ground Skeletal Sample

The NYABG sample consisted of 419 recovered burials of which 301 were available for study based on preservation (see Appendix C). Determinations of age and sex were based on multiple methods of aging and sexing for adults and aging methods for subadults, as discussed in Chapter Four. Therefore, paleodemographic assessments are based on these 301 individuals. The adult skeletal remains available for study totaled 171 individuals for whom age and gender could be determined, including 102 males and 69 females. In addition there were 130 ageable subadult skeletons. Therefore, subadults were 43.2 percent of the total sample and adults were 56.8 percent. In this chapter, five year age interval groups are used for demographic analyses (see Chapter 4 for the detailed discussion on aging).

Mortality

New York African Burial Ground overall mortality, based on the total demographic skeletal sample (N=301), was elevated in the first two years of life. This

was followed by a decreased mortality until late adolescence/early adulthood (with a slight increase at age 4-5 that may or may not be relevant), mortality remained elevated throughout adulthood. Mortality was highest for infants 0-6 months (9.6%), adults in the 30-34 age group (9.1%) and 45-49 year olds (8.3%) (Figure 7.1).

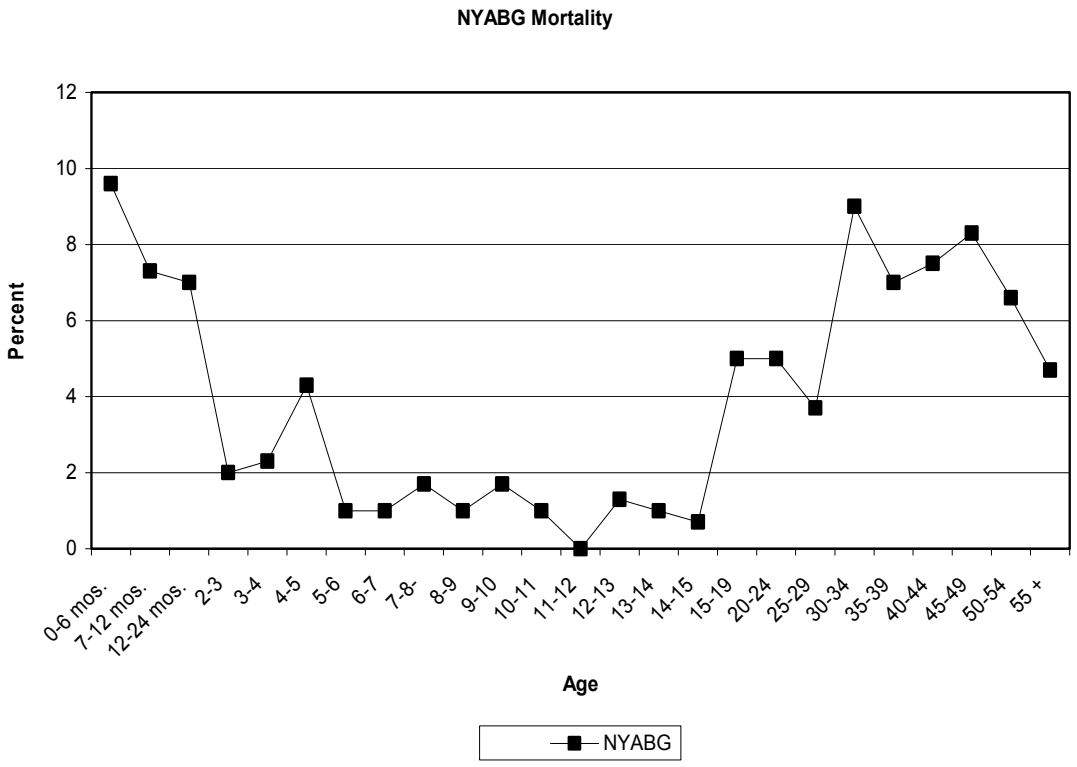

Figure 7.1: New York African Burial Ground Mortality

Adult Mortality

Adult mortality was highest in the third and fourth decades of life where 28.1 percent of adults died in each decade. Female mortality (37.6%) was highest in the 30-39 age group, close to double the rate of males (21.6%). Male mortality was highest (34.3%) in the fourth decade (40-49), while female mortality was lower almost by half (18.8%). Thus a differential mortality trend by sex can be observed with approximately two-thirds of the females (62%) dying by the end of the fourth decade, compared to 45

percent of the males. Notably, many young adults aged 15-19 are present in the burial ground, which is usual.

In general, females entering their reproductive years have higher biological risks than males under "non-stressful" socio-economic/environmental circumstances. In the ABG, both groups have similar and high rates. In general demographers consider age 12-35 a "trauma bump" in mortality especially for males both in historical and contemporary populations (Bogue 1969). Therefore, the apparent death rates for 15-19 and 20-24 year old males may be a typical phenomenon with other factors such as interpersonal violence, accidents, and high risk behaviors contributing to young adult mortality. Yet, these data indicate that females were under "stress" during a period of their lives when they should have been reproducing, not dying (see Figure 7.2 and Table 7.1). Several explanations can be proposed here: 1) similar mortality rates for young men and women may result from their being a greater proportion of the captives imported to New York and are therefore represented in the skeletal sample in greater numbers; 2) these young adults may have represented newly arrived captives who were unsuccessful in adapting to a new environment and the lifestyle of enslavement; 3) possible bias in the skeletal sample; 4) that enslaved Africans entered into young adulthood biologically compromised and were at greater risk of susceptibility; or 5) an interaction of all the above factors.

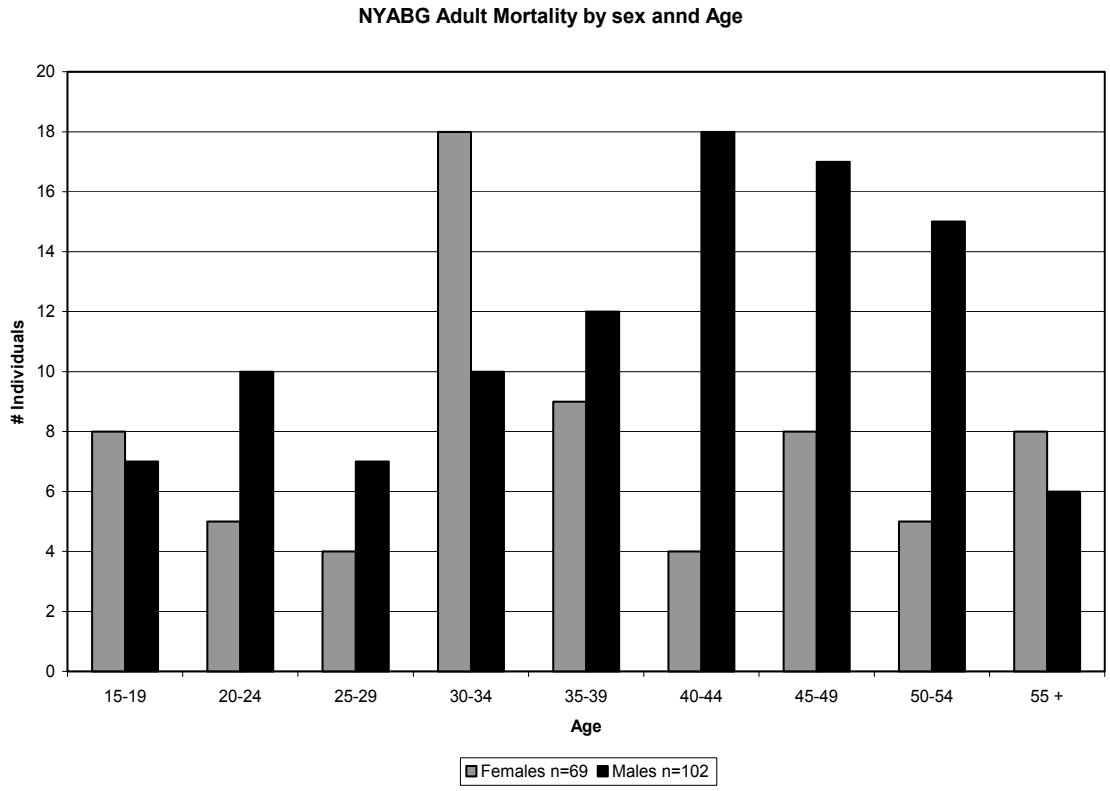

Figure 7.2: New York African Burial Ground Mortality by Sex and Age

Table 7.1: New York African Burial Ground Adult Mortality

	Male			Female			**Adults**		
Age Group	**N**	**% Male**	**% Total**	**N**	**% Female**	**% Total**	**N**	**% Total**	**% Adult**
15-19	7	6.9	2.3	8	11.6	2.7	15	5.0	8.8
20-24	10	9.8	3.3	5	7.2	1.7	15	5.0	8.8
25-29	7	6.9	2.3	4	5.8	1.3	11	3.7	6.4
30-34	10	9.8	3.3	17	24.6	5.6	27	9.0	15.8
35-39	12	11.8	4.0	9	13.0	3.1	21	7.0	12.3
40-44	18	17.6	6.0	5	7.2	1.7	23	7.5	13.5
45-49	17	16.7	5.6	8	11.6	2.7	25	8.3	14.6
50-54	15	14.7	5.0	5	7.2	1.7	20	6.6	11.6
55 +	6	5.9	2.0	8	11.6	2.7	14	4.7	8.2
	102	100	33.9	69	100	22.9	171	56.8	100

Subadult Mortality

Subadult mortality is an important factor in overall population stability and viability eventually affecting natural population growth. If indeed as Sattenspiel and Harpending (1983) argue, subadult skeletal remains actually represent subadult birth rates rather than deaths, and then birth rates can be inferred as being high; yet overall African population growth in New York City was low and gradual. The majority of subadult deaths (39.2%) occurred during the first year of life, followed by another 16.2 percent in the second year. Therefore, 55.3 percent of all the subadults died by age two. A sharp decline between ages two and four, with a doubling at age 4-5 is followed by a radically decreased mortality until adulthood (Table 7.2).

Table 7.2: New York African Burial Ground Subadult Mortality

Age Category	N	% Subadults	% Total
0-6 months	29	22.31	9.6
7-12 months	22	16.92	7.3
12-24 months	21	16.1	7.0
2 - 3	6	4.6	2.0
3-4	7	5.3	2.3
4-5	13	10.0	4.3
5-6	3	2.3	1.0
6-7	3	2.3	1.0
7-8	5	3.8	1.7
8-9	3	2.3	1.0
9-10	5	3.8	1.7
10-11	4	3.1	1.0
11-12	0	0	0
12-13	4	3.1	1.3
13-14	3	2.3	1.0
14-15	2	1.5	.7
	130	100	43.0

Historical Demography of Africans in Early New York

It has been estimated that at a minimum, 6800 Africans were imported into New York colony between 1700 and 1774, with approximately 2800 coming directly from Africa and 4000 from the Caribbean and Southern colonies. Perhaps one-fifth to one quarter of them remained within the city of New York (Lydon 1978: 382-383, 388). Many lived there for the rest of their lives, had children, and were eventually buried in the African Burial Ground. Some gained legal freedom, gradually building a free African population (which nevertheless had to fight to attain basic civil liberties), but most died enslaved.

The county of New York did not maintain official death records prior to the early nineteenth-century. The quantitative data available, therefore, are from church records, and are for the European rather than the African community; only nine deaths of Africans appear among thousands recorded in the surviving colonial New York church records. Most of these available church records provide limited information. Age at death, is given by only a few denominations, and for limited time periods. For example, the Dutch Reformed Church only provided categories (male, female, child, and infant) thus rendering the records unquantifiable. Overall demographic research on the Middle Atlantic colonies is severely limited and does not provide a broad basis for comparative studies.

New York County's population grew steadily between 1698 and 1800, actually, increasing almost twelve-fold. The African population only grew eight fold during the same period. The proportion of Africans in New York fluctuated throughout the period, actually declining between 1786 and 1800. The Euro-American population remained

fairly constant (around 80-85% of the total population) until 1786 when it increased to 90 percent (Table 7.3).

Table 7.3: Population of New York County, 1698 - 1800

Year	Total	Black	% Black	White	%White
1698	4,937	700	14.2	4,237	85.8
1703*	4,391	799	18.2	3,592	81.8
1712	5,841	975	16.7	4,886	83.3
1723	7,248	1,362	18.8	5,886	81.2
1731	8,622	1,577	18.3	7,045	81.7
1737	10,664	1,719	16.1	8,945	83.9
1746	11,717	2,444	20.9	9,273	79.1
1749	13,249	2,368	17.9	10,926	82.1
1756	13,046	2,278	17.5	10,768	82.5
1771	21,863	3,137	14.3	18,726	85.7
1786	26,614	2,107	7.9	21,507	92.1
1790	31,225	**3,092	9.9	28,133	90.1
1800	57,663	***5,867	10.2	51,796	89.8

Source: Foote (1991:78) and White (1991:26), except 1703. Both Foote and White have corrected the raw figures. See also Kruger (1985:131), though there are some discrepancies in the percentages for 1786, 1790, and 1800.
* From census of households in New York City (see below). These figures differ from those given in the 1703 census of the colony of New York, which listed only 630 blacks.
** Includes 1,036 free and 2,056 enslaved blacks
*** Includes 3,333 free and 2,534 enslaved blacks

Age and Sex Structure

The proportion of men to women (sex ratio) is utilized for assessing a population's "stability". Relatively equal numbers between the sexes within each age group often suggest that the population has been in place long enough to effect the equilibrium produced through natural fertility. An equal sex ratio (presented as 100 on a scale in which lower numbers represent an under representation of males) also indicates a favorable availability of marital partners for the establishment of families. There are no standards for "normal" or "abnormal" sex ratios per se; it is the relationship of sex ratios with birth and death rates that are significant to population growth and age-sex structure. For example, a sex ratio of 110 would indicate that there is a preponderance of males; a sex ratio of 89 would indicate a shortage of males in the population. Of course the sex ratio in reproductive age group would have the greater short term impact on overall population growth. In many enslaved sugar, coffee, and/or tobacco plantations of the Caribbean the lower sex ratios combined with birth, death rates, and health care quality led to declining enslaved populations (e.g., Higman 1991; Fraginals 1977).

Historically the earliest phases of voluntary migration often produce sex ratios far in excess of 100, due to the initial large migration of men prior to the migration of women. Recent immigrants also tend to have fewer children, and the elders tend not to migrate. Essentially, the majority of first wave in-migrants tend to come from the most economically productive age groups.

These populations tend to grow rapidly as time goes on and as women arrive in large numbers and children proliferate, especially in agrarian communities. A population's growth and fertility are more dependent upon the number of reproductive

females than on the number of reproductive males. When considering enslaved populations in many cases, these historically and contemporary identified trends occur in the early phases of capture and trade, as trade in human cargo escalates the needs of the prevailing political economy shapes the age-sex composition and sex ratio of the enslaved population. Several of the same population trends associated with voluntary migration are also observed in the New York African population, despite the fact that involuntary migration of enslavement was based on a selective process external to the captive men, women, and children. In 1626, the Dutch Colony of New Netherlands initially imported 11 men followed by the first three enslaved African women in 1628 (McManus 1966). This selection process of captors focused on able bodied, economically productive males and eventually females, and excluded those segments of low labor value; namely, the very young, the old, and the infirm. This phenomenon also had an impact on African demographic patterns by establishing a pattern of under population and under development of the African continent.

Eighteenth century censuses identified by project historians provide a source for New York inhabitants including Africans. As in all historic documents, the potential for inaccuracy is recognized, understanding that undercounts of both enslaved Africans and European Americans is probable. The selective nature of the slave trade is further substantiated in the New York 18th century censuses where the proportional rates of African adults relative to children (excluding 1731 and 1737 where adults = 10 years of age and older) were highest (Table 7.4). New York's African adult population was fairly consistent around 60-65 percent; in 1746 it decreased to 56 percent followed by a return to the earlier higher rates.

Table 7.4: African Population by Age and Sex, 18th Century Censuses

Year	Adults Male	Adults Female	Children Male	Children Female	Age Cutoff	Label in Census	Notes
1703	298	276	124	101	≤16	negroes	
1712	321	320	155	179	≤16	slaves	
1723	408	476	220	258	not given	negroes and other slaves	presumed 16
1731	599	607	186	185	≤10	blacks	
1737	674	609	229	207	≤10	black	
1746	721	569	419	735	≤16	black	black adult males includes 76 males over 60
1749	651	701	460	556	≤16	black	black adult males includes 41 males over 60
1756	672	695	468	443	≤16	black	black adult males includes 68 males over 60
1771	932	1085	568	552	≤16	black	black adult males includes 42 males over 60
1786	896	1207				slaves, negroes	

Source: *Century of Population Growth*, checked against *Docs. Rel. Col. Hist. NY.* Some discrepancies in the Kruger and Foot numbers have been corrected.

Sex Ratio

Throughout the eighteenth century based on historical documents and contemporary literature (Kruger 1985) sex ratios tended to indicate an excess of females, or numbers equivalent to males (Table 7.5). A substantially greater number of males are reported only for 1746 (126.7%) and 1737 (110.7%). The proportion of males (but not their absolute numbers) decreased most markedly following periods of political upheaval in the Americas (Table 7.5, see Chapter 14 for further discussion). Low sex ratios have been observed as an urban phenomenon during enslavement and antebellum periods in several states and the Caribbean. For example, Higman (1991, 1984) observed low black sex ratios in West Indian towns and Morgan (1984) in Charleston, South Carolina, that also had a preponderance of women in many years. Since females were of great value as domestics within towns and cities, women were actively sought by slaveholders and by early urbanites in non-slaveholding states. Domestic work was not an easier work regime; domestics were engaged in strenuous physical labor, as evidenced by skeletal biological and paleodemographic assessments of the First African Baptist Church cemetery, nineteenth century urban "free people of colour" (Rankin-Hill 1997).

Table 7.5: Sex Ratio New York City County 1703-1819

YEAR	SEX RATIO	NOTES
1703	107.9	
1712	100.3	
1723	85.7	
1731*	98.7*	*Note that in 1731 and 1737, the censuses counted persons over or under 10 years of age; thus "adults" were not all of childbearing years. The overall sex ratio for these years was 99.1 for 1731 and 110.6 for 1737.
1737*	110.7*	*ibid.
1746	126.7	
1749	92.9	
1756	96.7	
1771	85.9	
1786	NA	State census did not count blacks by sex
1790 1800 1810	NA	Federal censuses did not count blacks by sex
1805	72.3	local censuses for the early 19th century (Kruger 1985:370)
1819	65.8	
		Source: *Century of Population Growth*. Discrepancies were found in Foote's and Kruger's numbers, and have been corrected. The numbers in *Century of Population Growth* were checked in *Docs Rel. Col Hist NY*.

Comparison with the New York Colonial European-American Community

Historical records provide few contemporary comparative populations, European–American or African for the eighteenth century. The best potential source for mortality was the Trinity Church and burial ground records. Trinity Church, an Anglican Church near the ABG site, is one of the oldest churches in New York City. Many of the cemetery residents were most probably the actual owners of those interred in the ABG. The data set was compiled from a publication of existing church records (Corporation of Trinity Church 1969) by the project's Office of Public Education and Information covering the period from 1700 to 1777. Although records and epitaphs were available for

a greater length of time, these were excluded due to the turmoil and subsequent evacuation of New York City during the Revolutionary War. These church records, as any historical document, can have intrinsic flaws and/or biases; these can include non-recordation, interment elsewhere or religious, social and/or political exclusion from the cemetery among other reasons. The Trinity church burial population sample consists of 327 interments, 187 adults and 140 children; of these, there were 100 male and 87 female adults.

Adult mortality patterns between the two populations differ somewhat dramatically; to some extent they are inverse images of each other (Figure 7.3). In comparing adults by age and sex and subadults, a differential pattern between European and African New Yorkers can be observed. The Trinity Church males have moderate death rates during the "middle" ages and are primarily dying in later life (with great longevity into the 80's and 90's). The only age group where Trinity mortality exceeded African Burial Ground males was in the 25-29 and 55+ age groups (Figure 7.4). This higher rate of death in the mid 20s may be explained by the in-migration of young men, who would then be present in greater numbers in death or interpersonal violence. Other reasons for the early mortality of English men are still under investigation by historians. African male mortality was the highest at 35-49 followed by ages 20-24. Therefore NYABG males were experiencing significantly higher mortality rates in early adulthood.

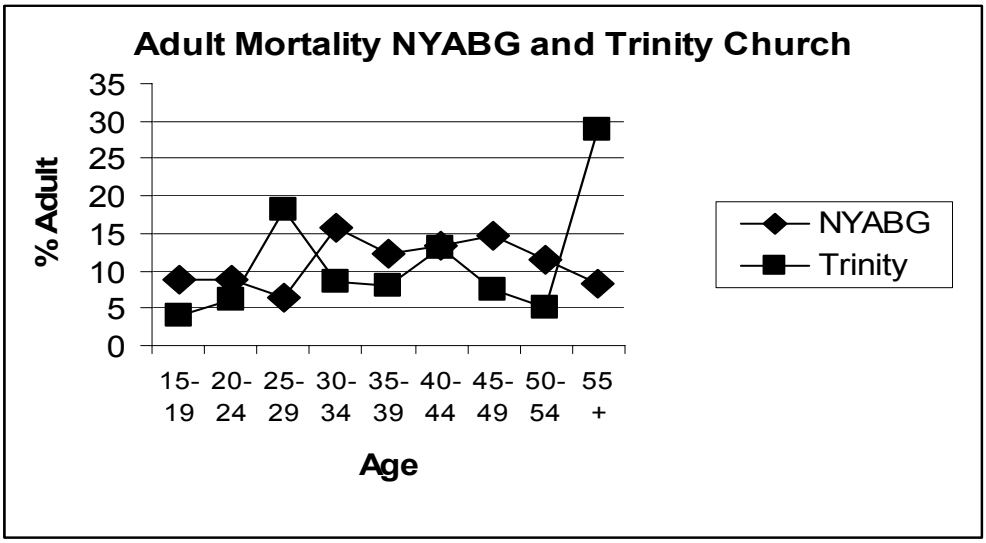

Figure 7.3: Adult Mortality NYABG and Trinity Church

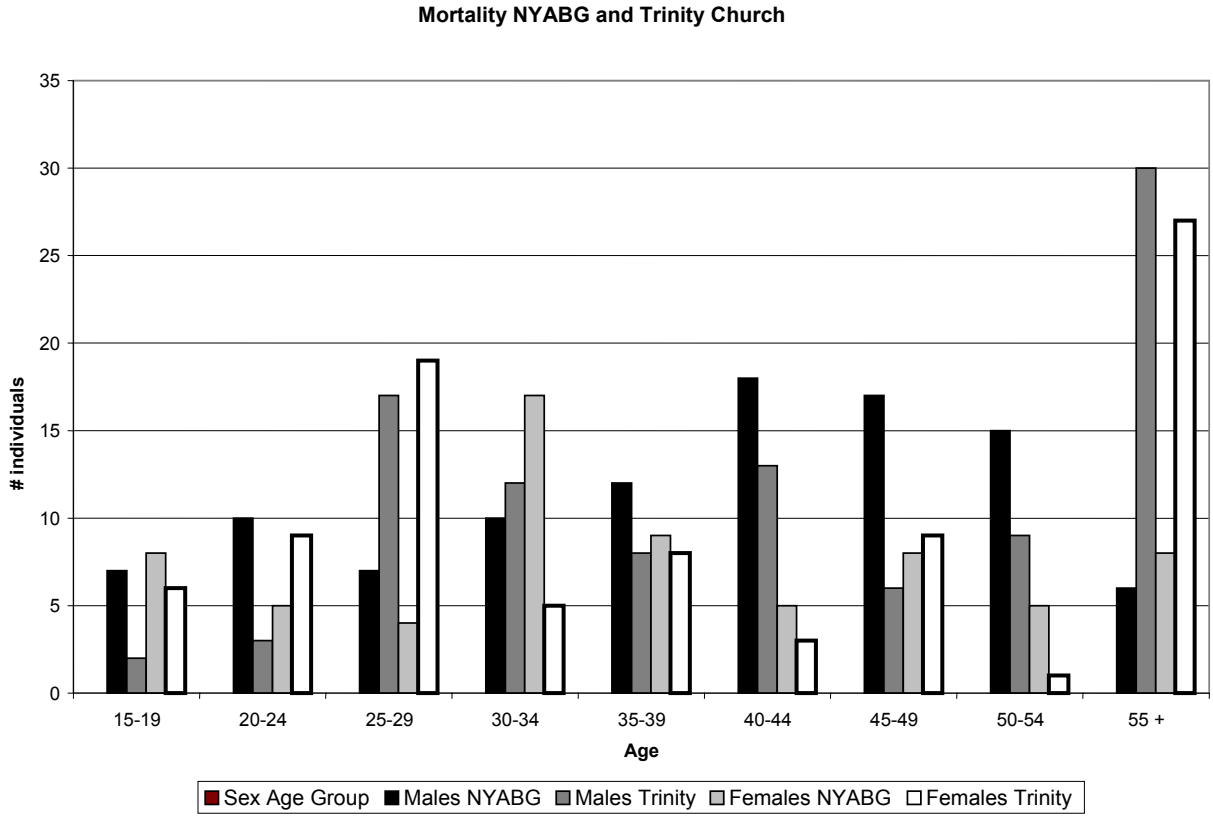

Figure 7.4: Mortality NYABG and Trinity Church by Sex and Age

Female mortality for Trinity Church peaks at ages 55+ and 25-29; the longevity of English women is only slightly less than that of males and, of course, much higher than the ABG women. High mortality in the 25-29 age group is a repeated pattern throughout the eighteenth and nineteenth centuries in America, primarily based on the stresses of reproduction; this pattern does not decline until the early twentieth century. The NYABG women are proportionately dying at higher numbers throughout early adulthood; by age forty, 62 percent of ABG women and 54 percent of their European counterparts have died. Yet the women of Trinity Church have a reduced mortality regime after the 25-29 peak and go on to live to older ages; very few African women made it to old age (Figure 7.4).

Subadult mortality for Trinity Church was slightly higher in the first year of life, exceeding the ABG in the second year of life, 10 percent and 4 percent respectively (Table 7.6). The overall mortality regime for the NYABG and Trinity Church were almost identical in pattern with high early childhood mortality and a dramatic decline for ages 5-9 and 10-14 (Figure 7.5).

Table 7.6: NYABG and Trinity Church Subadult Mortality

Age	NYABG	% Subadults	Trinity	% Subadults
0-5	98	75.4	119	85.0
5-9	19	14.6	15	10.7
10-14	13	10.0	6	4.3
	130	100.0	140	100.

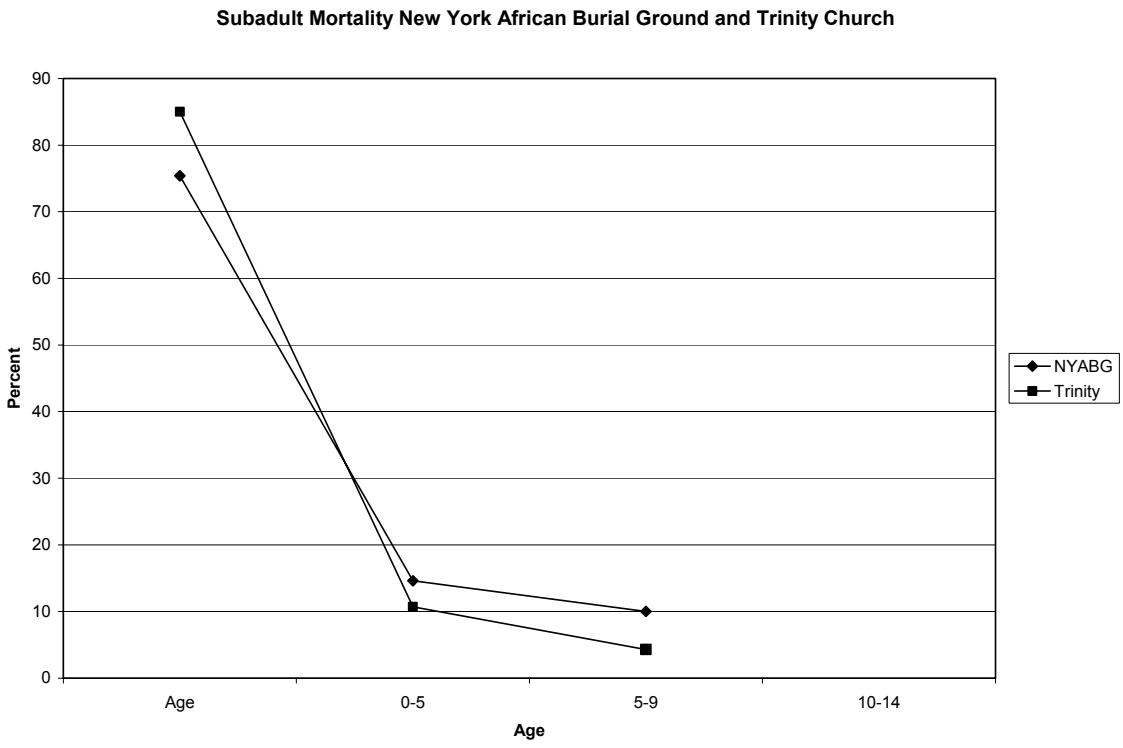

Figure 7.5: Subadult Mortality NYABG and Trinity Church

Young children and infants are always underrepresented in historical cemetery populations but the under representation in archaeological cemeteries with varied preservation conditions (such as the ABG) tend to be dramatically higher. Most of the Trinity Church mortality data used here derive from archival records and Corruccini et al. (1982) clearly show that such records of infant mortality in contemporary (eighteenth century) Barbados are several times greater than the numbers of infant skeletons they observed (better preserved adults skeletons were comparable to archival figures). Hence, the pattern of mortality fits what is known about the colonial period characterized by epidemics and unhealthy sanitary conditions that affected the morbidity and mortality of all colonial Americans. The overall impact on this enslaved population was more dramatic.

It is very clear from these data that the factors affecting age at death were very different among enslaved Africans and the prominent English parishioners of Trinity Church who held them in bondage. Both English men and women lived to old age up to 10 times more often than did Africans.

Comparative Skeletal Biological Studies of the African Diaspora

The limited skeletal series of Africans in the Diaspora that have been studied represent a broad spectrum of life styles and biohistory throughout the eighteenth, nineteenth, and early twentieth centuries (Table 7.7). These skeletal biological series include: South Carolinian plantation enslaved (Rathbun 1987); Maryland industrial enslaved (Kelley and Angel 1983); ex-slaves and their descendants from rural Arkansas (Rose 1985); urban slaves from New Orleans (Owsley et al. 1987); poor and destitute urban dwellers (Blakey and Beck 1982) from reconstruction period Atlanta; slaves from several small (1–9 burials) southern farms or plantations (Angel et al. 1987); Philadelphia urban "free people of colour" Angel and Kelly et al.1987; Rankin-Hill 1997; Crist et al. 1999) and the only Caribbean series, Barbadian sugar plantation enslaved (Handler and Corrucini 1986). Availability of the majority of these Afro-American skeletal populations for analysis has been limited (two weeks to several years) due to their historical status and/or exhumation conditions. Only one skeletal series has been curated, that of Catoctin Furnace (Kelley and Angel 1983); the remainder have been reburied or scheduled for reinterment.

There are three general trends observed in all African diasporic skeletal series, which concur with biohistorical life style and health analyses (see, for example, Kiple and Kiple 1980; Rankin-Hill 1997): (1) high infant and child mortality; (2) periods of malnutrition and

disease indicated by linear enamel hypoplasias and nonspecific infectious lesions; and, (3) high incidence of degenerative joint diseases and muscle attachment area hypertrophy, evidencing the physically strenuous lives of Africans in the New World. Differential patterns are observed among and between these African diaspora skeletal series in longevity by sex, general health status, type, and incidence of trauma. These studies demonstrate the need for regionally, temporally, historically, and culturally focused studies of Africans in the new world. Comparisons and conclusions regarding African diasporic skeletal biological studies have varied based on several factors: the preservation of the skeletal remains, which affects the types of analyses possible; the methodologies undertaken by different investigators; and the presentation of data. The following section encapsulates provenience and demography of the major African diasporic skeletal series. These skeletal series provide comparisons for the NYABG where data was available and appropriate.

Newton Plantation, Barbados, West Indies

Corruccini and coworkers (1982) have undertaken the only large study of an Afro-American enslaved population from the Caribbean. This series represents a population involved in an intensified sugar plantation economy. This slave cemetery, associated with the Newton plantation in Barbados, consisted of 103 individuals interred between 1660 and 1820. These analyses indicated a mean age at death of 29.3 years; due to poor preservation not differentiated by sex. Historical data available on Newton plantation's captives aided the evaluation of the demographic patterns determined from the scarce skeletal remains. These data "show vastly greater infant and child mortality, stability with relatively low mortality ages 10–35, then consistently greater mortality by age 40 than is indicated by skeletal aging" (Handler and Lange 1978: 286).

St. Peter Street Cemetery, Louisiana

The St. Peter Street Cemetery in New Orleans, Louisiana, dating circa 1720 and 1810, was studied by Owsley et al. (1987). St. Peter's served as New Orleans' principal cemetery during the city's first seventy years under both Spanish and French rule. Until the discovery of the NYABG, this cemetery represented the earliest urban African-American skeletal population that had become available for study.

The sample consisted of twenty-nine individuals, twenty-three adults aged twenty and over, and six subadults (one infant, two aged 5–9, and three aged 15–19); of these, thirteen (45%) were identified as African Americans and were most probably enslaved people. Females appear to have had a shorter life span than males, with peak mortality at 20–24 years of age and slightly higher rates of death, while male peak mortality was at 40–49 years. But Owsley and coworkers caution that an "inherent sample bias may misrepresent the actual mortality curve of the colonial population" (1987, p.10) due to small sample size and the under-representation of infants and children.

Catoctin Furnace, Maryland

The Catoctin Furnace Cemetery in Frederick County, Maryland, dates from the late 1790s to 1820. The skeletal population studied represented only one-third of the cemetery population, since the rest of the cemetery had been covered by a state highway. This skeletal material became available during the widening of the highway and constitutes a small sample of thirty-one individuals (fifteen adults, fourteen children under age twelve, and two teenagers). These individuals were members of an iron working enslaved community, and primarily represented kin (Kelley and Angel 1983). Females were at greater risk of early death in this industrial slave community, as indicated by a mean age at death of 35.2 years for

females and 41.7 for males, a pattern of earlier female mortality comparable to post-Reconstruction Cedar Grove.

38CH778, South Carolina

Inadvertently discovered during construction-related ground leveling, site 38CH778 was the slave cemetery associated with a plantation outside of Charleston, South Carolina (Rathbun 1987). Thirty-six individuals, interred between 1840 and 1870, were recovered and subsequently reinterred. Skeletal remains consisted of twenty-eight adults (thirteen male, fifteen female) and eight subadults. Males appear to have been at greater risk of earlier mortality, with a mean age at death of 35 years, versus 40 years for females.

First African Baptist Church (1821-1843), Philadelphia, Pennsylvania

The First African Baptist Church (FABC) Cemetery, located in what is today known as Center City Philadelphia, was discovered in November 1980, during the excavation of the Philadelphia Commuter Rail tunnel. The cemetery was in use circa 1821-1843 until the Board of Health closed it down. The members of the FABC congregation buried in the cemetery represent a community of ex-enslaved and freeborn African Americans. The FABC cemetery consisted of 144 burials; of these, 135 skeletons were recovered. There were 75 adult and 60 subadult skeletons. The adults consisted of 36 males and 39 females. The majority of subadults (55%) were infants (0-6 months). Females, in general, died earlier than males. The mean age at death for FABC females was 38.9 years and 44.8 years for males (Angel and Kelley 1987; Rankin-Hill 1997).

Cedar Grove, Arkansas

The Cedar Grove Baptist Church Cemetery (Rose 1985) was the burial site of a post-Reconstruction (1890–1927) rural African-American population that consisted of descendants of the local plantation freedmen. The revetment of the Red River by the Army Corps of engineers led to the salvage excavation of burials scheduled for destruction. The seventy-eight burials excavated comprised 73.6 percent of the total cemetery population and represented 40 percent of the cemetery's usage time since it's founding in 1834.

Demographic patterns suggested that the Cedar Grove sample represented a highly stressed population. Females and infants constituted a high percentage of the cemetery population, an indication of high infant mortality (27.5%) and of a life expectancy of fourteen years at birth. Adult (above age 20) mean age at death was 41.2 years for males and 37.7 years for females. Thus, females had an earlier and higher mortality rate than males, a pattern opposite to that of the enslaved at 38CH778, South Carolina, but similar to that of other African diasporic skeletal series (e.g., Catoctin Furnace).

Table 7.7: Skeletal Series of the African Diaspora

Site/Location	Time Periods	Total No. Burials	Life Style	Preservation	Analysis/Status
Newton, Barbados	1660–1820	103	plantation slaves	fragmentary	months/reinterred
New York African Burial Ground	1694-1794	419	urban slaves	fragments-excellent	7 years - reinterred 2003
Colonial sites	1690–1820	29	plantation slaves	poor-good	indefinite/available[1]
St. Peter's Cemetery, New Orleans	1720–1810	13	urban slaves	Poor	3 years/reinterred
Catoctin Furnace, Maryland	1790–1820	31	industrial slaves	poor/fragments	indefinite/available[1]
FABC 8th Street, Philadelphia	1821–1843	144	ex-slaves/freeborn	poor-good	3 years/reinterred
FABC 11th, Street - Philadelphia	1810–1822	89	ex-slaves/freeborn	poor-good	5 years/reinterred
38CH778, South Carolina	1840–1870	36	plantation slaves	poor-good	1 year/reinterred
Oakland Cemetery – Atlanta, Ga.	1866–1884	17	poor and indigent	fragments-excellent	? /reinterred
Cedar Grove Cemetery Arkansas	1890–1927	78	rural farmers	poor-excellent	2 weeks/reinterred

Source: Rankin-Hill 1997, 2001

1 = Remains available Smithsonian Institution, Museum of Natural History.

Mean Age at Death

The mean age at death for the NYABG sample was 22.3. The low mean age at death reflects the high childhood mortality in the New York population. The NYABG mean age at death by sex was 38.0 for males and 35.9 for females. The slight advantage of males is common in many African diasporic skeletal populations (Table 7.8), with the

Table 7.8: Mean Age at Death for Afro-American Skeletal Populations

AFRO-AMERICAN SKELETAL POPULATIONS	MEAN AGE AT DEATH		
	Males	Females	Total
New York African Burial Ground	38	35.9	22.5
First African Baptist Church Cemetery*	44.8	38.9	41.3
Cedar Grove, Arkansas**	41.2	37.7	39.5
38CH778, South Carolina***	35.0	40.0	37.5
Catoctin Furnace, Maryland****	41.7	35.2	38.4
St. Peter Street Cemetery, Louisiana ***** +AGE RANGE	20-24+	40-49+	-
Newton Plantation, Barbados, West Indies******	-	-	29.3

Angel et al. 1987, Rankin- Hill 1997*
Rose1985**
Rathbun 1987***

exception of enslaved plantation South Carolinians and New Orleans urban enslaved; however, this may be an artifact of the small skeletal sample and preservation status. An independent samples *t*-test was run in SPSS using the composite ages for adult NYABG males and females to test for difference in the mean age at death; no significant difference was found t=1.190, p>.05 (p=2.36).

NYABG women have a lower mean age at death than the women from the iron working Maryland Catoctin Furnace site where women were devalued as workers since they only contributed domestic chores. In each of the comparisons, the maximum age of 55+ was used,

therefore making the comparisons possible and avoiding one of the potential biases of this calculation. All of the skeletal series with the exception of the Newton plantation had a range of preservation status that allowed for multiple methods of aging and sexing (in order to increase accuracy and reliability), as did the NYABG sample. In attempting to test whether there was a statistically significant difference among sample mean age at death considering the difference in sample size, a one-way ANOVA was undertaken in SPSS for NYABG, FABC and Catoctin Furnace. The analysis was limited to these three samples because composite ages were not available for the others and mean ages were based on published data. The ANOVA yielded no significant differences of mean age of death among the three populations, $F(2, 260) = .791$, $p>.05$ ($p=.454$). In addition, population size has no significant effect on mean age of death, $F(2, 260) = .791$, $p>.05$ ($p=.454$).

In determining whether there was a statistically significant difference between male and female means at death within populations, an independent samples t-test was run to see if there were sex differences across all samples for mean age at death. This test yielded significant sex differences in mean age at death across all samples, $t(261) = 2.964$, $p<.05$ ($p= .003$). This was followed by individual independent samples t-test for within sample differences by sex for the three samples. As reported above for the NYABG sample, there was no significant differences; for Catoctin Furnace, there were also no significant sex differences in mean age of death, $t(13) = 1.285$, $p >.05$ ($p =.221$); and for the FABC, there were significant sex differences in mean age of death, $t(75) = 3.160$, $p<.05$ ($p=.002$).

Mortality

The NYABG infant mortality rate (under 12 months) is low at 15.18 percent compared to FABC at 25 percent. Since the New York population only represents a segment of a large cemetery population, and FABC represents the entire cemetery, the under representation of infants due to excavation selection and poor preservation associated with site conditions may partly explain the lower infant mortality. Other possibilities could include burial of infants outside of the cemetery or that a greater number of infants survived; eventually dying in later childhood or early adolescence.

NYABG early childhood mortality did not appear to have a bimodal tendency as observed in both the Cedar Grove post-Reconstruction African-American population (Rose 1985) and FABC nineteenth century free African Americans in Philadelphia (Rankin-Hill 1997). In both populations, there was a high infant mortality rate during the first six months followed by a decline, and then an increase again during the second year, which may have been associated with a weaning period. In the NYABG sample, however, early childhood mortality remained high throughout the first two years of life (Table 7.9).

Table 7.9: NYABG, FABC and Cedar Grove Subadult Mortality by Age Group

	NYABG		FABC		Cedar Grove	
Age in Years	N	% Deaths	N	% Deaths	N	
0-6 mos	29	22.3	26	43.3	17	38.6
7-12 mos.	22	16.9	8	13.4	5	11.4
< 2	21	16.2	11	18.3	11	25.0
3–5	26	20.0	4	6.7	1	2.3
6–15	32	24.6	11	18.3	10	22.7
	130	100.00	60	100.00	44	100.00
< 1	51	39.2	34	56.7	22	50.0

Survivorship and Life Expectancy

Life table data, such as age-specific probability of dying and life expectancy, may be compared to other unsmoothed life table data for other regionally, temporally, and/or socio-culturally comparable populations or to the patterns observed in model life tables. Examples of commonly used model life tables are those developed by Weiss (1973), based on both ethnological and skeletal populations, and those developed by Coale and Demeny (1966) for isolating abnormal characteristics in mortality profiles (Moore et al. 1975). Through these demographic analyses, population parameters can be generated, and long-term trends in adaptation, health, and disease can be examined.

As discussed earlier, life tables in particular have generated severe criticism in recent years because of the inherent problems of reduced accuracy in aging skeletons and whether the skeletal samples meet the fundamental assumptions of model life tables; 1) a stable static population, 2) that mortality is not selective, and 3) that risk is constant throughout the population (Wood et al. 1992). In actuality, very few if any prehistoric, historic or contemporary populations would meet these criteria. In prehistoric and historic skeletal populations, one or more of these criteria is either violated or unknown to the researcher. In the NYABG sample and most African diasporic collections, all of the criteria are not met (whether working historical documents or skeletal data). In recent years, sophisticated statistical modeling techniques have been undertaken in order to ameliorate problems created by failure to meet criteria. In the case of samples that do not meet the criteria, there are also greater issues. These issues are primarily associated with their biological heterogeneity and whether they are actually a biological population simply because they had similar life experiences and ended their lives interred in the

same cemetery. This discussion is not appropriate for a contract report such as this. Therefore, with clear knowledge of the limited "value" of life table analysis, some basic observations will be presented herein.

A life table using unsmoothed data was constructed for the NYABG sample using an Excel database computerized life table (Table 7.10).

Table 7.10: New York African Burial Ground Life Table

TOTAL Age Interval (in years) (x)	No. of Deaths (Dx)	% of Deaths (dx)	Survivors Entering (lx)	Probability of Death (qx)	Total Years Lived Between X and X+5 (Lx)	Total Years Lived After Lifetime (Tx)	Life Expectancy (e0x)
0-5m	29	8.50	100.00	0.0850	9.575	2409.545	24.10
6-12m	22	6.45	91.50	0.0705	8.827	2399.971	26.23
1-2	27	7.92	85.04	0.0931	92.757	2391.144	28.12
3-4	20	5.87	77.13	0.0760	370.968	2298.387	29.80
5-9	19	5.57	71.26	0.0782	342.375	1927.419	27.05
10-14	13	3.81	65.69	0.0580	318.915	1585.044	24.13
15-19	32	9.38	61.88	0.1517	285.924	1266.129	20.46
20-24	21	6.16	52.49	0.1173	247.067	980.205	18.67
25-29	17	4.99	46.33	0.1076	219.208	733.138	15.82
30-34	34	9.97	41.35	0.2411	181.818	513.930	12.43
35-39	31	9.09	31.38	0.2897	134.164	332.111	10.58
40-44	20	5.87	22.29	0.2632	96.774	197.947	8.88
45-49	26	7.62	16.42	0.4643	63.050	101.173	6.16
50-54	19	5.57	8.80	0.6333	30.059	38.123	4.33
55+	11	3.23	3.2 3	1.0000	8.065	8.065	2.50
Total::	341	Crude Mortality Rate:		41.50			

In addition, life tables generated for FABC and Cedar Grove were utilized for comparisons (Rankin-Hill 1997). Survivorship was higher for the ABG sample compared to Cedar Grove until age 45, although paralleling FABC and MT30–60.0 in adulthood. The ABG sample had higher survivorship in early childhood than Cedar Grove, FABC, and both model

tables. Nevertheless, survivorship (lx) for NYABG, FABC, Cedar Grove (MT15.0–45.0), and MT30–60.0 clearly demonstrate the impact of infant mortality on the overall pattern (Figure 7.6).

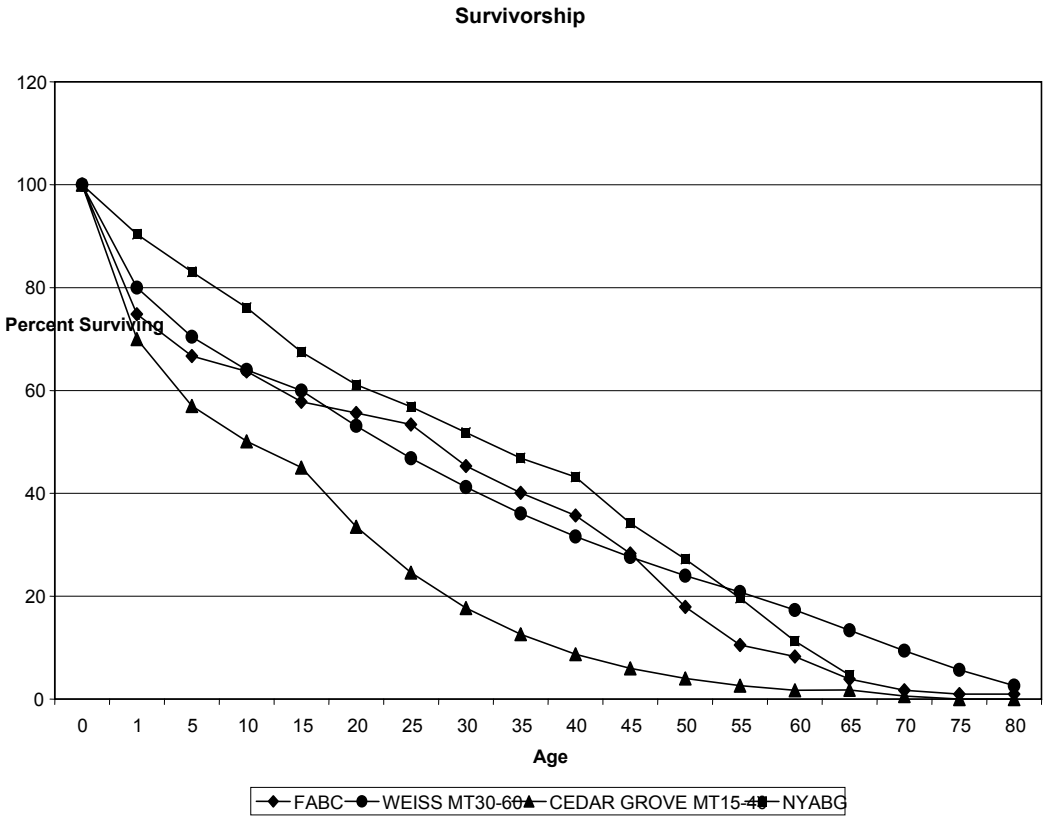

Figure 7.6: Survivorship

An independent samples *t* test yielded no significant sex differences in survivorship within the ABG sample, t (16) = .339, p>.05 (p=739). A one-way ANOVA was run for NYABG, FABC, and Cedar Grove, but the analysis yielded no significant differences in survivorship among the three groups F (3, 68) = 1.282, p>.05 (p=.288).

Life Expectancy

Life expectancy ($E^{o}x$) at birth for the NYABG members was 24.2 years. By ages 3-4, life expectancy rose to 30.38 years reflecting the higher incidence of death for subadults under two years old, therefore the impact of higher risk of dying. Two life tables for adults by sex were also generated for the NYABG. A comparison of these tables indicates different trends based on sex. Males at age 15-19 and 20-24 had a life expectancy of 24.1 and 21.03, respectively. By age 25-30, male life expectancy was 18.21 (Table 7.11).

Table 7.11: New York African Burial Ground Male Life Table

Males Age Interval (in years) (x)	No. of Deaths (Dx)	% of Deaths (dx)	Survivors Entering (lx)	Probability of Death (qx)	Total Years Lived Between X and X+5 (Lx)	Total Years Lived After Lifetime (Tx)	Life Expectancy ($e^{0}x$)
15-19	7	6.86	100.00	0.0686	482.843	2441.176	24.41
20-24	10	9.80	93.14	0.1053	441.176	1958.333	21.03
25-29	7	6.86	83.33	0.0824	399.510	1517.157	18.21
30-34	10	9.80	76.47	0.1282	357.843	1117.647	14.62
35-39	12	11.76	66.67	0.1765	303.922	759.804	11.40
40-44	18	17.65	54.90	0.3214	230.392	455.882	8.30
45-49	17	16.67	37.25	0.4474	144.608	225.490	6.05
50-54	15	14.71	20.59	0.7143	66.176	80.882	3.93
55+	6	5.88	5.88	1.0000	14.706	14.706	2.50
Total :	102	Crude Mortality Rate:		40.96			

At ages 15-19 and 20-24, females had a life expectancy of 22.07 and 19.63, respectively; by age 25-30, female life expectancy was 16.16 (Table 7.12).

Table 7.12: New York African Burial Ground Female Life Table

Females

Age Interval (in years) (x)	No. of Deaths (Dx)	% of Deaths (dx)	Survivors Entering (lx)	Probability of Death (qx)	Total Years Lived Between X and X+5 (Lx)	Total Years Lived After Lifetime (Tx)	Life Expectancy (e^0x)
15-19	8	11.59	100.00	0.1159	471.014	2221.014	22.21
20-24	5	7.25	88.41	0.0820	423.913	1750.000	19.80
25-29	4	5.80	81.16	0.0714	391.304	1326.087	16.34
30-34	17	24.64	75.36	0.3269	315.217	934.783	12.40
35-39	9	13.04	50.72	0.2571	221.014	619.565	12.21
40-44	5	7.25	37.68	0.1923	170.290	398.551	10.58
45-49	8	11.59	30.43	0.3810	123.188	228.261	7.50
50-54	5	7.25	18.84	0.3846	76.087	105.072	5.58
55+	8	11.59	11.59	1.0000	28.986	28.986	2.50
Total:	69	Crude Mortality Rate:		45.02			

An independent samples *t* test in SPSS was run that indicated no statistically significant sex differences in life expectancy within the NYABG sample, t (16) = .051, p>.05 (p=.960).

New York African Burial Ground life expectancy (24.2) was considerably higher than the 14 years reported by Rose (1985) at Cedar Grove and slightly lower than the 26.59 years reported for FABC (Rankin-Hill 1997) (Figure 7.7). NYABG life expectancy was compared to Weiss's (1973:175) model life table MT30.0–60.0 and to MT15.0–45.0 (1973:118), reported by Rose as the most comparable table to the Cedar Grove mortality experience. The MT15.0–45.0 table exemplifies a highly stressed subadult population, although infant mortality was actually higher. The NYABG life expectancy curve fits closely to the FABC from ages 10-45. Subadult life expectancy clearly points to the perils of surviving early childhood in New York. The initial

childhood years from birth to age 10-15 are lower than the Weiss MT30.0–60.0 and

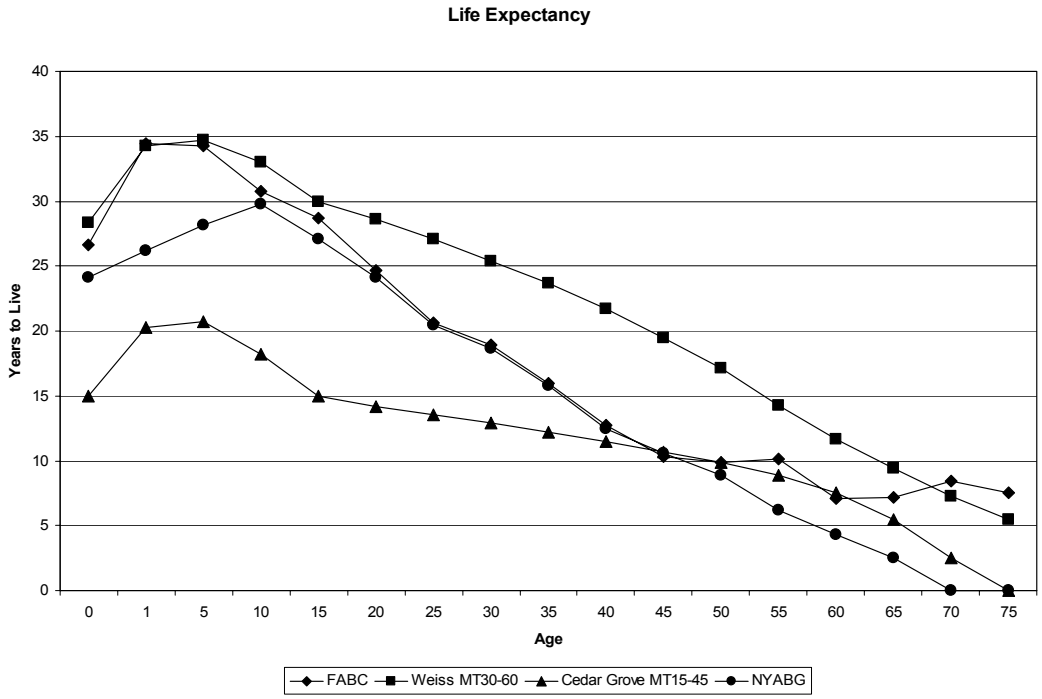

Figure 7.7: Life Expectancy

FABC, but higher than that for Cedar Grove. NYABG and FABC are similar from age 20, declining at comparable rates. NYABG life expectancy declines even more rapidly than for the "highly stressed" Cedar Grove group after age 45. The differences between NYABG, Cedar Grove, and FABC life expectancy and mortality experience are significant. Clearly, post-Reconstruction Cedar Grove rural Arkansas African-Americans were at highest risk of dying earlier. However, at the end of the life span, life expectancy was dramatically reduced for the NYABG sample.

Summary of Findings for the NYABG Sample

Paleodemography:

- Mortality was highest for:
    - Infants 0-5 months (9.6%).
    - Adults 30-34 year olds (9.1%).
    - Adults 45-49 year olds (8.3%).
- Young adults aged 15-19 comprised 8.8 percent of the sample.
- A differential mortality trend by sex was observed:
    - 62 percent of the females died by the end of the fourth decade.
    - 45 percent of the males died by the end of the fourth decade.
    - Female mortality (37.6%) peaked at age 30-39.
    - Male mortality (34.3%) peaked at age 40-49.
- Subadult mortality was 43.2% for the NYABG (N=301).
    - 39.2 percent died during the first year of life.
    - 16.2 percent died in the second year.
    - 55.3 percent of all the subadults died by age two.

Historical Demography:

- Age-sex composition and sex ration were shaped by the prevailing political economy.
- New York Africans had a low sex ratio and slow population growth, similar to the Caribbean plantation pattern.
- Sex ratios indicate either more females or equal numbers of males and females.
- The proportion of African males decreased markedly following periods of political upheaval in the Americas.

European-American Comparison

- High mortality in women 25-29 based on reproductive stress is an ubiquitous American pattern throughout the eighteenth and nineteenth centuries declining in the early twentieth.
- Observed is a differential pattern between European and African New Yorkers.
- Trinity Church males have moderate death rates during "middle" ages and great longevity.
- Trinity male mortality exceeded ABG males at 25-29 and 55+.
- Trinity female mortality peaked at 55+ and 25-29, with longevity slightly less than that of males and higher than that of ABG women.
- NYABG women are proportionately died at proportionately higher rates.
    - 62 percent of ABG women died by age forty.
    - 54 percent of European women died by age forty.
- Trinity Church women had a reduced mortality regime after the 25-29 age peak.

Skeletal Biological Comparisons

- Mean age at death for the NYABG cemetery sample was 22.5, including all ageable adults and subadults (N=301).
- Low mean age at death reflects high childhood mortality.
- ABG mean age at death was 38.0 for males and 35.9 for females.
- The bimodal tendency of childhood mortality observed in Cedar Grove and FABC is not present at the NYABG. Both had high infant mortality rates during the first six months, followed by a decline, then followed by an increase again during the second year. The ABG early childhood mortality remained high throughout the first two years of life.
- NYABG women have a lower mean age at death than the women from the iron working Maryland Catoctin Furnace, who were devalued as workers.

- Life expectancy ($E^{o}x$) at birth for the NYABG was 24.2 years by ages 3-4 and life expectancy rose to 30.38 years.
- NYABG life expectancy (24.2) was considerably higher than the 14 years reported for Cedar Grove, and slightly lower than 26.59 for FABC.
- The differences between NYABG, Cedar Grove, and FABC life expectancy and mortality experiences are significant:
    - Cedar Grove post-Reconstruction rural Arkansas African-Americans were at highest risk of dying earlier.
    - At the end of the life span, life expectancy was significantly reduced for the NYABG sample.